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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/562,347 | 06/20/2006 | Maurits Van Camp | UMC.10024 | 6257 |

45473 7590 07/11/2008
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| EXAMINER | |
|---|---|
| MCGUTHRY BANKS, TIMA MICHELE | |
| ART UNIT | PAPER NUMBER |
| 1793 | |
| MAIL DATE | DELIVERY MODE |
| 07/11/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/562,347 | VAN CAMP ET AL. | |
| | Examiner | Art Unit | |
| | TIMA M. MCGUTHRY-BANKS | 1793 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *14-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *14-16,20 and 26-29* is/are rejected.

7)☒ Claim(s) *17-29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/27/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Status of Claims*

Claims 1-13 are cancelled and Claims 14-29 are new.

### *Examiner's Interpretation*

Since applicant does not exemplify or define the claimed term "valorization" or "valorising," the examiner will interpret this limitation as recovering zinc and lead for further use.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-16, 20 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Novoa et al (US 4,248,624) in view of Stevenson (US 3,756,804), alternatively in view of Ford, Jr. (US 5,922,261) and Evans et al (US 3,830,639).

Novoa et al teaches using prereduced ore in a blast furnace (abstract), in the form of sponge (column 2, line 58), to produce pig iron. However, Novoa et al does not teach subjecting a residue to a direct reduction step, extracting zinc and lead bearing fumes, producing an iron-bearing slag, or extracting the second metals-bearing fumes as in Claim 1.

Stevenson teaches treatment of flue dust from iron making furnaces to recover minor constituents therefrom (column 1, lines 13-15). The flue dust comprises Fe, Zn, and Pb (column 2). Various types of furnaces are used for the process of steel, e.g. blast furnaces, and there is a substantial amount of flue dust discharge (lines 44-51). The flue dust is combined with carbon and prepared into a blend. The blend is conveyed to a furnace in a reducing atmosphere. Lead and zinc (ZnO) will be volatilized (column 3, lines 15, 16, and 48-74). The metallic gases are conducted away from the furnace, condensed, precipitated and collected (column 4, lines 1-5). The furnace is a tower with hearth sections forming a sequence of levels (column 4, lines 37-40).

Iron constituents are changed from oxides to metallic iron (column 5, lines 13 and 14).

Regarding subjecting a residue to a direct reduction step, extracting zinc and lead bearing fumes, and extracting the second metals-bearing fumes, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the flue dust reclamation process of Stevenson with the process of Novoa et al, since Stevenson teaches recovering valuable constituents from steel making flue dust, converting the iron therein to useful form, and rendering the remaining tailings suitable for disposal (column 1, lines 57-62). The examiner also notes that sponge iron and prereduced iron are synonymous in the art of iron-making, and are a result of direct reduction. Regarding Claims 15 and 16, all of the iron was reduced to magnetic iron (column 7, lines 6 and 7). Regarding Claim 27, zinc oxide is formed. Regarding Claim 28, the hearth with sections reads on a multiple hearth furnace.

Alternatively, regarding subjecting a residue to a direct reduction step and extracting zinc and lead bearing fumes, Ford, Jr. teaches forming iron-rich material waste products as shown below:

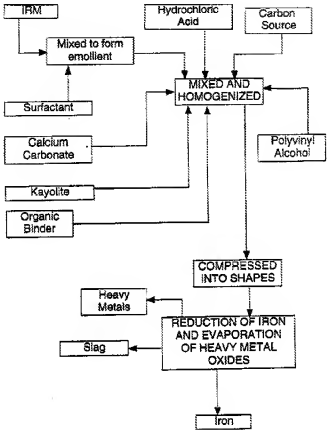



FIGURE 1

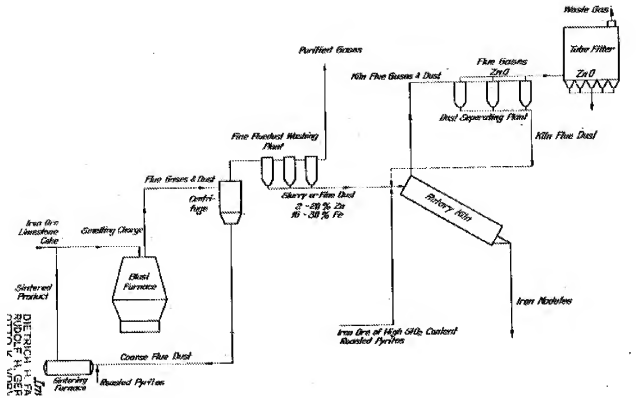
The heavy metal oxides include lead and zinc (column 2, lines 65). The teaching of using hydrochloric acid and polyvinyl alcohol reads on a weak acid. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the residue treatment of Ford, Jr. with the process of Novoa et al, since Ford Jr. teaches that the material is formed is durable enough for handling and storage as well as sufficient to bind the shapes to inhibit early disintegration (column 3, lines 5-22). Regarding Claim 20, the teaching of using hydrochloric acid and polyvinyl alcohol reads on a weak acid.

Regarding producing an iron-bearing slag, Evans et al teaches that blast furnace slag comprises $Fe_2O_3$ (column 3, line 45). It would have been obvious to one of ordinary skill in the art at the time the invention was made to expect that the slag produced in the blast furnace in Novoa et al would also contain iron oxide as taught by Evans et al.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Novoa et al in view of Stevenson and Evans et al as applied to claim 14 above, and further in view of Fastje et al (US 2,836,487).

Regarding Claim 29, the tuyeres of the blast furnace reads on submerged lances, since the charging material produces a molten iron product (Novoa et al, column 1, lines 26-42).

Novoa et al in view of Stevenson and Evans et al discloses the invention substantially as claimed. However, Novoa et al in view of Stevenson, alternatively in view of Ford, Jr., and Evans et al does not disclose that the residue contains Ge as claimed. Fastje et al teaches separating iron from other metals, in which accompanying metals are volatilized during the reduction of the iron (column 1, lines 17-20) as shown below:




The volatilizable metals include germanium, lead, and zinc (column 3, lines 52 and 53). It would have been obvious to one of ordinary skill in the art at the time the invention was made to expect that the process of Novoa et al in view of Stevenson and Evans et al would include volatilizing and recovering Ge, since Fastje teaches that Ge is produced during the production of iron in a blast furnace. Regarding the second metals-bearing fumes, Stevenson and Fastje teach recovering blast furnace fumes.

### *Allowable Subject Matter*

Claims 17-19, and 21-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Regarding Claims 17-19 (and 21 and 22), Evans et al teaches that the slag comprises $Fe_2O_3$ (ferric oxide), not FeO (ferrous oxide). Regarding Claim 23, the prior art of record does not disclose or suggest oxidizing iron and a separate copper-alloy phase containing a major part of the Cu and Ag. Regarding Claims 24 and 25, the prior art of record does not disclose or suggest forwarding the Ge fraction to the oxidizing smelting step as in Claim 24.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koros et al (US 6,120,577) teaches recovering iron values and separating zinc oxides and other contaminants from steel mill waste metal oxides such as blast furnace dust, BOF dust, mill scale and oily sludges (abstract).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 7:00 am - 3:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art Unit 1793

/T. M. M./
Examiner, Art Unit 1793
10 July 2008